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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/847,127	05/02/2001	Charles Anthony Dafft	A01043	5418

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ROHM AND HAAS COMPANY
PATENT DEPARTMENT
100 INDEPENDENCE MALL WEST
PHILADELPHIA, PA 19106-2399

EXAMINER

PRICE, CARL D

ART UNIT	PAPER NUMBER
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3743

DATE MAILED: 09/09/2003

14

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/847,127

Applicant(s)

DAFFT ET AL.

Examiner

CARL D. PRICE

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-- Th MAILING DATE of this communication appears on th cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15-18 and 20-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-18,20-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 08-25-2003 has been entered.

Response to Arguments

Applicant's arguments with respect to newly presented claims 1-14 have been considered but are moot in view of the new ground(s) of rejection.

Original claims 1-14 and 19 have been canceled by applicant.

New claims 20-23 have been added.

Applicant argues that the prior art of record does not show or disclose a process for flaring including the steps combusting a "dilute gaseous waste stream not capable of self-

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sustaining combustion“ in conjunction with a flare where the flare feed stream is a flare gas blend having at a first and second gas stream where the blend has at least 3 mole % hydrogen based on the total moles of the flare gas blend”. The prior art references of “Basis and Purpose Document on Specification For Hydrogen-fueled Flares” U.S. Environmental Protection Agency, Office of Air Radiation, Office of Air Planning Standards, Research Triangle Park, North Carolina 27711 (March 1998) (of record), herein after referred to as “Hydrogen-Fueled Flares”, Vickery and Milfred et al are now relied on to address the claimed limitations of applicant’s invention continue to form the basis of the examiner’s position regard 15-18 and 20-23.

Applicant’s attention is directed to the portions of “Hydrogen Flares” discuss by the examiner in the previous office action. More specifically applicant’s attention is directed to:

“Hydrogen-Fueled Flares” which states “Flares are commonly used in industry to safely combust VOC and volatile HAP.”. And, “Some organic emission streams can be flared without the need for supplemental fuel. However, the use of supplemental fuel such as natural gas to ensure the complete combustion of emissions is common”. (section 2.1, page 2). “Hydrogen-Fueled Flares” also states (section 2.1, page 3) that “These existing flare provisions require that the waste gas being flared have a minimum heat content, which is specific to the flare head design, and maximum waste gas flow rate.”. And, “Hydrogen-Fueled Flares” further states (section 3.2, page 9) that “The specific goals of the test plan were (1) to quantify the stability envelope (minimum gas hydrogen content versus exit velocity for flame stability) for

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hydrogen/waste gas mixtures having hydrogen concentrations and velocities in the range of DuPont's flares, ...".

While applicant's argument that the intent of "Hydrogen Flares" is to make the case for EPA approval of operation of DuPont hydrogen flares, "Hydrogen Flares" acknowledges and indeed clearly teaches that "the use of supplemental fuel such as natural gas to ensure the complete combustion of emissions is common" (section 2.1, page 2) even though "Some organic emission streams can be flared without the need for supplemental fuel, such as in the case of the DuPont hydrogen flares. Additionally, "Hydrogen Flares" (see page 9) includes additional disclosure, although arrived at during a testing plan to determine flame stability (e.g.- the point at which the hydrogen/waste gas "**blend**" becomes incapable of self-sustaining a flame, known as "lift-off" and "blow out"). "Hydrogen Flares" states, "The specific goals of the test pan were (1) to quantify the stability envelope (minimum gas hydrogen content versus exit velocity for flame stability) for hydrogen/waste gas mixtures having hydrogen concentrations and velocities in the range of DuPonts flares..." and "The experiments were done by establishing a stable flame at the desired velocity, then slowly decreasing the hydrogen flow rate and recording the velocity and hydrogen content at flame lift off and again at blow out. Lift off was defined as the time when a portion of the flame was permanently separated from the flare tip. Blow out was defined as complete absence of the flame.". DuPont therefore clearly establishes that it is known to operate waste gas flares with a "blend" of hydrogen and waste gas, were the waste gas, even when diluted with an amount of hydrogen gas, is not capable of self-sustaining combustion, as evidenced by flame lift off and blow out. DuPont indeed does disclose that when

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hydrogen is added, or blended, to a diluted waste gas stream, otherwise not capable of self-sustaining combustion, "Destruction efficiencies greater than 98 percent were achieved at hydrogen contents as low as 0.955 times the hydrogen content at lift off. Destruction efficiencies greater than 99 percent (95 percent confidence level) were achieved at a ratio of hydrogen content to hydrogen content at lift off greater than 1.0.". "Hydrogen Flares" therefore clearly acknowledges that it is known to convert at least 80% of a diluted waste gas blend to carbon dioxide and water, as claimed by applicant, since the 98 percent destruction of the waste gases in DuPont necessarily results in converting "at least 80%" of the waste gas blend into carbon dioxide and water, the understood result of combusting hydrocarbons with an oxidant.

It remains the examiners position that the limitation that the blend has at least 3 mole % hydrogen" and converting at least about 80% of the flare gas blend into carbon dioxide and water" (claim 15) applicant has arrived at the claimed blend in order to achieve "optimal or workable ranges" merely through routine experimentation.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 15-18 and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over “Hydrogen-Fueled Flares” (of record), alone, or in view of Vickery (newly cited) or Milfred et al. (newly cited).

“Hydrogen-Fueled Flares” discloses the invention substantially as set forth in the claims with possible exception to the hydrogen/waste gas blend having at least 3 mole % hydrogen, a heating value of about 10-275 Btu/scf and 70 w % or lower hydrocarbon concentration”, converting at least about 80% of the flare gas blend into carbon dioxide and water” and the first, or hydrogen stream being produced from a synthesis gas, or from ammonia disassociation.

“Hydrogen-Fueled Flares” discloses a process for flaring including the steps of combusting a flare feed stream in conjunction with a flare where the flare feed stream is a flare gas blend having at a first hydrogen and second hydrocarbon containing waste gas (volatile VOC and HAP). “Hydrogen-Fueled Flares” states “Flares are commonly used in industry to safely combust VOC and volatile HAP.”. And, “Some organic emission streams can be flared without the need for supplemental fuel. However, the use of supplemental fuel such as natural gas to ensure the complete combustion of emissions is common”. (section 2.1, page 2). “Hydrogen-Fueled Flares” also states (section 2.1, page 3) that “These existing flare provisions require that the waste gas being flared have a minimum heat content, which is specific to the flare head design, and maximum waste gas flow rate.”. And, “Hydrogen-Fueled Flares” further states (section 3.2, page 9) that “The specific goals of the test plan were (1) to quantify the stability envelope (minimum gas hydrogen content versus exit velocity for flame stability) for

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hydrogen/waste gas mixtures having hydrogen concentrations and velocities in the range of DuPont's flares, ...".

Both Vickery and Milfred et al teach, from the same combustion field of endeavor as the "Hydrogen-Fueled Flares", mixing, or blending, a quantity of hydrogen into a waste gas feed supply for the purpose completely incinerating industrial the waste gases (waste gases from reactors, ovens, into carbon dioxide and water. Vickery discloses (column 3, lines 30-36) blending reactor or oven waste gases with a co-incineration fuel gas selected gases "such as hydrogen, methane (natural gas), propane, etc.,". Milfred et al teaches blending industrial gases (PAH, PCB, VOC) with a fuel gas selected gases "hydrogen".

In regard to claims 15-18 and 20-23, for the purpose of converting a gaseous waste material to carbon dioxide and water, it would have been obvious to a person having ordinary skill in the art to blend a mixture of hydrogen, natural gas or propane with a product waste gas stream prior to entering the "Hydrogen-Fueled Flares", in view of the teachings of either Vickery or Milfred et al. In regard to claims 15-18 and 20-23, since the claimed amount of hydrogen, and amount of blended gas being converted to water and carbon dioxide, would depend on numerous design concerns such as the chemical composition of the gaseous waste, the size of the flare, the gas velocity, etc., to form a blend of hydrogen/waste gas having at least 3, or 4, mole % hydrogen, a heating value of less than 913 Btu/scf and 70 w % or lower hydrocarbon concentration", converting at least about 80% of the flare gas blend into carbon dioxide and water" can be viewed as nothing more than a mere matter of choice in design absent the showing

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of any new or unexpected results produced therefrom over the prior art of record, or merely the optimum or workable ranges for a given flare arrangement determined by routine experimentation. In regard to claims 17 and 18, Official Notice is taken that it is known to produce hydrogen from synthesis gas and/or ammonia dissociation. Thus, in view of that which is well known, to form the first hydrogen stream being produced from a synthesis gas, or from ammonia dissociation, as a known source for the hydrogen gas, would have been obvious to a person having ordinary skill in the art of combustion.

Conclusion

See the attached PTO FORM 892 for prior art made of record and not relied upon and considered pertinent to applicant's disclosure.

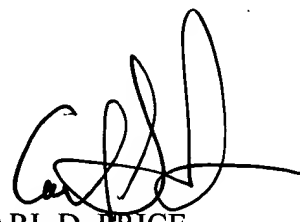
USPTO CONTACT INFORMATION

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CARL D. PRICE whose telephone number is 703-308-1953. The examiner can normally be reached on Monday through Friday between 6:30am-3:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Henry Bennett can be reached on 703-308-0101. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9302 for regular communications and 703-872-9303 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-1148/0858.

A handwritten signature in black ink, appearing to read 'CDP', with a long horizontal stroke extending to the right.

CARL D. PRICE
Primary Examiner
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cp
September 5, 2003